

vations at the Lick Observatory are recorded in the *Astrophysical Journal*, vol. viii. p. 150 :—

1896	Nov. 11·8	...	...	...	—2·0
	Nov. 12·8	...	...	...	—1·8
1897	Jan. 19·6	...	...	...	—3·5
1898	July 12·0	...	...	...	—2·1

Curiously enough, the dates of the latter observations are so related as not to give decisive evidence as to which of the suggested periods is most probable.

More material is required, and it should be gathered in photographs taken at short intervals. I beg to present this note in the hope that other observers may be able to secure observations whilst a *Persei* is in favourable position.

1900 November 8.

On the Disappearance from Photographic Films of Star-images and their Recovery by the aid of a Chemical Process. By Isaac Roberts, D.Sc., F.R.S.

On p. 15 of my second volume of photographs of *Stars, Star-Clusters and Nebulae* I gave instances of the disappearance of the images of many faint stars from the films of negatives, which had been taken nine and a quarter and nine and one-fifth years respectively, between the dates when the images were counted. This statement was seen by Sir William Crookes, and he informed me that probably by the application of chemical reagents the images that had become invisible might be restored to view ; and further he generously offered to try the experiment if I would send him the negatives ; which offer, of course, I gladly accepted.

The two negatives referred to in my book were sent, and in a short time they were returned to me with the request that I should examine them and report if the experiment had succeeded. I thereupon recounted the star-images on the plates and found that every one of the missing images had been restored to view as distinctly, I think, as they were after the negatives were first developed ; the experiment therefore had succeeded perfectly.

Sir William Crookes readily placed at my disposal the formulæ of the reagents he had employed in the experiment, with permission to publish them, thus placing me, and all others who may be engaged in the work of photographing the stars and nebulae, under obligation to him.

The following are the formulæ and processes employed by Sir William Crookes as they were given in his letter to me :—

- “1. Soak the plate for three hours in distilled water.
- “2. Prepare, in advance, two solutions, A and B.

SOLUTION A.

Pyrogallie acid . . . 1 oz.
 Sodium metabisulphite 1 oz.
 Water 80 oz.

SOLUTION B.

Sodium carbonate (crystals) 12 oz.
 Sodium sulphite 4 oz.
 Water 80 oz.

"Mix equal parts of A and B, and allow the plate to soak in the mixture for ten minutes or a quarter of an hour, in the dark. Wash well.

"3. Transfer the washed plate to a solution of 3 oz. of sodium hyposulphite in 20 of water. Allow it to remain for half an hour, and then wash the plate in running water for three hours.

"4. Prepare a 'Clearing' solution according to the following formula :—

Alum 1 oz.
 Citric acid 1 oz.
 Ferrous sulphate 3 oz.
 Water 20 oz.

"Allow the plate to soak in this for ten minutes, and then remove and wash in running water for six hours.

"5. Prepare, in advance, two solutions, C and D.

SOLUTION C.

Ammonium sulphocyanide 100 gr.
 Water 10 oz.

SOLUTION D.

Gold chloride . . . 15 gr.
 Water 15 oz.

"For use take 1 oz. of each, and add 8 oz. of water. Soak the plate in this mixture for ten minutes, and at the end of the time remove and wash it in running water for half an hour. Transfer to a dish of distilled water, where it may remain for an hour. Finally drain on blotting paper and allow to dry.

"The separate solutions A, B, C, D will keep for an indefinite time, and the same may be said of the clearing solution, if kept tightly corked. But when mixed together they will not keep, so fresh mixtures should be made each time.

"I have given you the full process adopted on the plates you sent me, but I think some of them may be omitted with no disadvantage. For example, I should like to try if the soaking in hyposulphite may be dispensed with. I think it can, but I only tried leaving it out on the plates you sent that had not faded.

"I always found the great secret of preventing images from fading out was to wash them very well in running water. The clearing solution allows the time of washing to be a little shortened, but not much.

"The sulphocyanide and gold solution has the property of precipitating gold on the image, and rendering it of a blacker colour and diminishing the chance of fading. I should think

you would find it useful always to use the clearing solution and the sulphocyanide and gold solution in your usual process.

“(Signed) WILLIAM CROOKES.”

1900 July 6.

On the near Approach of the Planet Eros to a Star
(B.D. +48°, 759). By F. A. Bellamy.

The planet *Eros* is under regular photographic observation at the University Observatory, Oxford, for determining the parallax.

The plan of work adopted is to get several exposures as soon after sunset and as soon before sunrise as possible. It may be of interest to give a summary of plates at present taken. Fifty sets of exposures, either evening or morning, have been secured with an aggregate of 205 exposures, varying from 10^m to 30^s; on ten occasions pairs of parallax plates have been obtained (evening and morning). Since October 31 the weather has been very unfavourable, and only two plates have been exposed. All images of *Eros* and all the stars in the A.G. Catalogues of Harvard and Bonn which come within the area of the plates have been measured, and many of the plate constants determined provisionally. On October 12 the sky was thickly overcast until 8½ P.M. I came out of the Observatory a few minutes later and noticed a break in the clouds in the west, and decided to get the instrument ready in case a fine interval should come over; by 8.45 the sky was almost cloudless, and I secured 10 exposures on plates 1632 and 1633 within the next 50 minutes; 10 minutes later the sky was completely cloudy and remained so.

The chief point of interest in these two plates is the proximity of *Eros* to a star, since identified as B.D. +48°, 759. From the first to the fifth exposures the angular distance decreased, the planet moving north and west, until at the sixth and seventh exposures the images of star and planet are confused (see diagram, p. 18). The following measures were made by myself, using one of the Astrographic Catalogue measuring instruments, the unit adopted being 1 réseau interval of 5'.

Plates 1632 and 1633 Exposed 1900 Oct. 12. R.A. 2^h 42^m + 49°.

Exp.	Mag.		Eros <i>x</i>	★ <i>x</i>	Eros—★.	Eros <i>y</i> .	★ <i>y</i> .	Eros—★.	Oxford Sid. Time of Middle of Exposure.		
	Eros.	★							h	m	s
1	18	17	14.124	14.082	+ .042	10.966	11.057	— .091	22	6	12
2	15	15	.116	.077	+ .039	.895	10.970	— .075		11	22
3	20	20	.114	.080	+ .034	.812	.874	— .062		16	27
4	19	19	.106	.079	+ .027	.731	.778	— .047		21	46
5	16	17	.100	.075	+ .025	.649	.679	— .030		25	57
6	21?	22?	.062	.049	+ .013	.939	.942	— .003		36	12
7	18?	20?	.060	.050	+ .010	.849	.838	+ .011		41	2
8	16	19	.055	.046	+ .009	.758	.733	+ .025		45	27
9	14	18	.050	.047	+ .003	.651	.619	+ .032		49	2
10	10	13	14.046	14.042	+ .004	10.562	10.516	+ .046	22	52	42